

Please amend the application filed on even date herewith prior to proceeding with its examination.

**IN THE CLAIMS**

1. (Currently Amended) The electrochemical cells modules made up of couples of catalytic multilayer porous electrodes forming the anodes and the cathodes and delimitating external gaseous areas and internal areas containing the electrolyte and connected by an external electric circuit characterized in that the cell module comprises:

- pressure modulators generating in use two pressure cycles independently synchronized but of opposite phase acting at the inlet and at the outlet of the circulating electrolyte,
- multilayer porous electrodes weeping on the gas side, and
- means for exchanging heat between the porous electrodes of the cell modules and an external heat source through the electrolyte [flowing into the electrochemical cell and fluctuating into the porous electrode] fluctuating into porous electrode and flowing into the electrochemical cell.

2. (Currently Amended) The electrochemical cell according to claim 1 wherein:

- the multilayer porous electrodes are conductive and hydrophobic on the gas side,
- the conductive and catalytic middle layers are hydrophobic and hydrophilic, and [the] a non-conductive, non-catalytic, and preferably hydrophilic, [layers] layer is on the electrolyte side.

3. (Currently Amended) The electrochemical cell according to claim[s 1 and] 2 wherein the pressure modulators are linked with two tanks containing in use the electrolyte at

two different pressures and each connected respectively at the inlet and at the outlet of the cell by a valve.

4. (Original) The electrochemical cell according to claim 3 wherein the opening section of the outlet valve  $S$  and of the inlet valve  $s$  are such that  $S > s$ .

5. (Currently Amended) The electrochemical cell according to claim[s 1-] 4 wherein the pressure modulators modulate in use at a frequency the period of which approaches the reaction times of the electrochemical reactions.

6. (Currently Amended) The electrochemical cell according to claim[s 1 to] 5 wherein in use an energy source provides an external continuous current to the porous electrodes such that at the cathode there is  $H_2$  formation and at the anode there is  $O_2$  formation, and in use the electrolyte is an aqueous solution of KOH.

7. (Currently Amended) The electrochemical cell according to claim[s 1 to] 5 wherein the electrolyte is an aqueous solution of KOH, electric energy is drawn from the porous electrodes by feeding the gas sides of the electrodes with respectively  $H_2$  and  $O_2$ .

8. (Currently Amended) Electrochemical process utilizing the electrochemical cells of claim[s] 1 [to 7] comprising the following steps:

- maintaining on the gas side a pressure  $P$  up to 200 bar;
- varying at the internal side discontinuously the electrolyte pressure in the range  $P+dP$  and  $P+dp$ .
- generating onto the electrolyte pressure positive waves of amplitude  $dP$  and  $dp$  with the frequency  $f$ : when one valve is open the other is closed and vice versa,
- exchanging heat between the porous electrodes of the cell modules and an

external heat source through the electrolyte [flowing into the electrochemical cell and fluctuating into the porous electrodes] fluctuating into porous electrode and flowing into the electrochemical cell.

9. (Original) Electrochemical process according to claim 8 wherein the overpressure are such that  $dP > dp$ .

10. (Previously Presented) Electrochemical process according to claim 9 wherein the two overpressures are applied for cycles of length  $\tau_{dP}$  and  $\tau_{dp}$  where  $\tau_{dP} < \tau_{dp}$  at the frequency  $f = 1/T$  where  $T = \tau_{dP} + \tau_{dp}$ .

11. (Previously Presented) Electrochemical process according to claim 10 wherein the two overpressures are applied at a frequency the period of which approaches the reaction times of the electrochemical reactions.

12. (Previously Presented) Electrochemical process according to claim[s] [8 to] 11 wherein an energy source provides an external continuous current to the porous electrodes such that at the negative electrode there is  $H_2$  formation and at the positive electrode there is  $O_2$  formation and the electrolyte is an aqueous solution of KOH.

13. (Currently Amended) The electrochemical process according to claim[s] [8 to] 11 wherein the electrolyte is an aqueous solution of KOH and electric energy is drawn from the porous electrodes by feeding the gas sides of the electrodes with respectively  $H_2$  and  $O_2$ .